

**REMARKS**

This communication is in response to the Office Action mailed May 3, 2007. Claims 1-22 are pending in the present application. Of the above, claim 2 has been cancelled, leaving claims 1, and 3-22 for consideration, upon entry of the present Amendment. Claim 1 has been amended to include the limitation in claim 2. Claims 3-22 have been amended to depend from a claim that has not been cancelled and/or to conform them to all of the requirements of U.S. practice. No new matter has been introduced by these amendments.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. For the reasons discussed herein, Applicants respectfully traverse the Examiner's rejections and request that the Examiner reexamine and reconsider patentability of the pending claims based, on the amendments and arguments herein.

**Abstract**

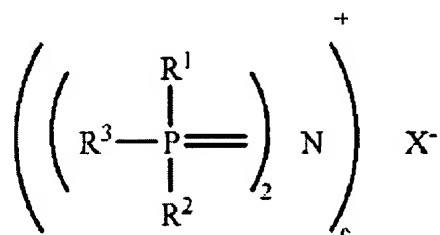
The Examiner asked Applicants to check and confirm that the format of the Abstract in the present application meets U.S. requirements. Applicants respectfully submit that the Abstract in the present application contains 58 words, which is within the required range of 50 to 250 words, and is in the proper language and format in accordance with the requirements. Accordingly, Applicants respectfully request that the Examiner withdraw this objection.

**Claim Rejection under 35 U.S.C. §102 (a), (b), or (e)**

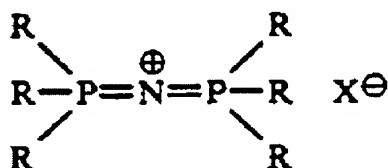
The Examiner rejected all pending claims under 35 U.S.C. § 102(a), (b), or (e) as allegedly being anticipated by U.S. Patent No. 5,045,632 ("the US '632 Patent") or EP 087657 ("the EP '657 Patent") or JP 10-045896 ("the JP '896 Patent"). Applicants respectfully traverse.

To establish a *prima facie* case of anticipation under Section 102(a), (b), or (e), each and every element set forth in the claims must be either expressly or inherently described in a single prior art reference, and the identical invention must be shown in complete detail, as is contained in the claims.

Initially, Applicants would like to point out that claim 1 has been amended and now recites that the catalyst includes a **phosphoranylidene ammonium salt**. Accordingly, all of the now pending claims in the application are directed to processes for preparing a **polycarbonate** resin by polymerizing a **starting material** including a **dihydroxy compound** and a **carbonic acid diester** in the presence of a catalyst including at least one **phosphoranylidene ammonium salt**, or a mixture of the phosphoranylidene ammonium salt and an alkali metal- or alkaline earth metal-containing compound. The general formula I showing the structure of the phosphoranylidene ammonium salt recited in the pending claims is as follows:



, which also can be drawn as



Formula I : Phosphoranylidene Ammonium salt

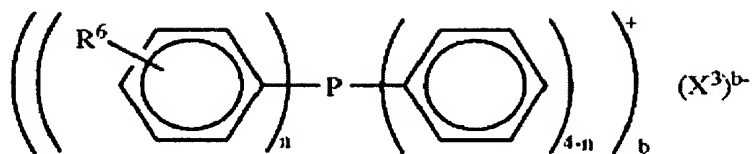
As shown above, the present invention refers to an ammonium salt, having both nitrogen and phosphorous atoms in the compound.

Although the US '632 Patent discloses the use of this type of catalyst, *i.e.*, bis(triphenylphosphoranylidene) ammonium salt, the US '632 Patent does not disclose each and every element set forth in the claims of the present application. First, the US '632 Patent does not teach or disclose a process of making a **polycarbonate** as the inventors have defined in the present application since the US '632 Patent does not disclose the same starting material. Instead of a dihydroxy compound and a carbonic acid diester as recited in the claims of the present application, the US '632 Patent discloses reacting oxirane groups in epoxy resins with aromatic carbonate and/or ester linkage, so that each carbonate linkage reacts with two epoxide groups, producing the **epoxy/carbonate/ester cured composition**. (See col.1 ll.26-67; col.6 l.62 to col.7 l.24.)

Because the US '632 Patent fails to teach each and every limitation as set forth in all of the pending claims either expressly or inherently (*i.e.*, a process of making polycarbonate resin by polymerizing the starting material including dihydroxy compound and carbonic acid diester), Applicants respectfully request the Examiner to review and withdraw the rejection based on the US '632 Patent under 35 U.S. C. § 102(a), (b), or (e).

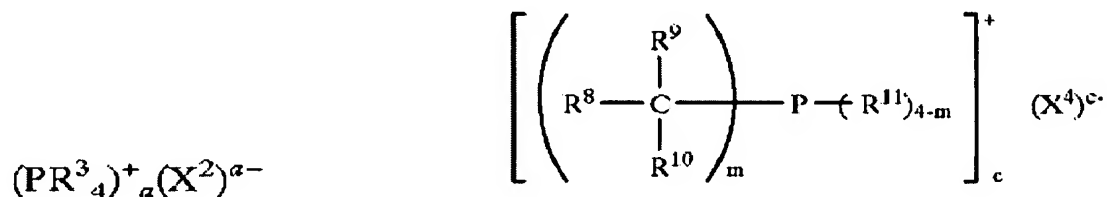
The EP '657 Patent is directed to a process for producing polycarbonate by polymerizing the same starting material recited in the claims of the present application, however, using a different catalyst than the one recited in the claims of the present application.

Instead of a **phosphoranylidene ammonium salt** catalyst, the EP '657 Patent uses a catalyst which is (1) a combination of a nitrogen-containing organic basic compound and a **quaternary phosphonium salt**; (2) a quaternary phosphonium salt represented by the general formula III (*e.g.* a tetraarylphosphonium salt):



(3) a quaternary phosphonium salt containing a branched alkyl group; and (4) a quaternary phosphonium salt. (See p.3, 11.12-40.)

A quaternary phosphonium salt is structurally and chemically very different than a phosphoranylidene ammonium salt. First, a quaternary phosphonium salt, which has the general formula as follows:



does not have the nitrogen atom in the compound. In addition, the claimed catalyst is a form of an ammonium salt (containing both nitrogen and phosphorus atoms), not a phosphonium salt. There is no teaching at all in the EP '657 Patent as to an ammonium salt that also contains a phosphorous atom, let alone the claimed phosphoranylidene ammonium salts.

Because the EP '657 Patent fails to teach each and every limitation as set forth in all of the pending claims either expressly or inherently (i.e., use of a phosphoranylidene ammonium salt or a mixture of phosphoranylidene ammonium salt and alkali metal- or alkaline earth metal-containing compound as a catalyst), Applicants respectfully request the Examiner to review and withdraw the rejection based on EP '657 Patent under 35 U.S. C. § 102(a), (b), or (e).

Lastly, the JP '896 Patent, which is assigned to the same assignee as the EP '657 Patent with common inventors, also does

not disclose the use of including phosphoranylidene ammonium salt or a mixture phosphoranylidene ammonium salt and alkali metal- or alkaline earth metal-containing compound as a catalyst. Instead, similar to the EP '657 Patent, the JP '896 Patent discloses a catalyst which includes a quaternary phosphonium salt.

Because the JP '896 Patent fails to teach each and every limitation as set forth in all of the pending claims either expressly or inherently (*i.e.*, use of a phosphoranylidene ammonium salt or a mixture phosphoranylidene ammonium salt and alkali metal- or alkaline earth metal-containing compound as a catalyst or alkaline earth metal-containing compound as a catalyst), Applicants respectfully request the Examiner to review and withdraw the rejection based on JP '896 Patent under 35 U.S. C. § 102(a), (b), or (e).

Applicants also respectfully submit that any obvious rejection based on any of the above mentioned references, *i.e.*, the US '632 Patent, the EP '657 Patent, or the JP '896 Patent, would be nothing more than an improper hindsight reconstruction that follows only the teachings disclosed in the Applicants' specification.

Moreover, Applicants would like to note that the specification of the present applications includes data demonstrating that the resulting polycarbonate resin made with the presently claimed catalyst has superior reactivity during melt polymerization and solid state polymerization compared to, for example, a quaternary ammonium salt or a quaternary phosphonium salt of the types described in the EP '657 and the JP '896 Patents.

For example, Table 1 at ¶ 136 of the published present application, reprinted below, demonstrates that using the catalyst within the scope of the present invention, *i.e.*, bis(triphenylphosphoranylidene) ammonium acetate, a

phosphoranylidene ammonium salt (in Example 1, containing both the nitrogen and phosphorous atoms), resulted in producing a polycarbonate resin of the type described and claimed with the highest weight average molecular weight. In comparison, the use of prior art catalysts, such as tetramethylammonium hydroxide, a quaternary ammonium salt (in Comparative Example 1, containing only the nitrogen atom) and tetrabutylphosphonium hydroxide, a quaternary phosphonium salt (in Comparative Example 2, containing only the phosphorous atom), resulted in a polycarbonate resin with lower weight average molecular weight.

TABLE 1

Classification	Polymerization Catalyst	Catalyst Concentration	Weight-Average Molecular Weight (MW)
Example 1	Bis(triphenylphosphoranylidene)ammonium acetate	$2.5 \times 10^{-4}$	6,769
Comparative Example 1	Tetramethylammonium hydroxide	$2.5 \times 10^{-4}$	3,400
Comparative Example 2	Tetrabutylphosphonium hydroxide	$2.5 \times 10^{-4}$	6,740
Example 2	Bis(triphenylphosphoranylidene)ammonium acetate	$1.0 \times 10^{-5}$	4,655
Example 3	Bis(triphenylphosphoranylidene)ammonium acetate	$1.0 \times 10^{-6}$	2,486
Example 4	Sodium acetate + bis(triphenylphosphoranylidene)ammonium acetate	$1.0 \times 10^{-6}$ $2.5 \times 10^{-4}$	7,557
Comparative Example 3	Sodium acetate	$1.0 \times 10^{-6}$	2,611

Furthermore, Table 2 at ¶ 143 of the published present application demonstrates that the use of the presently claimed catalyst (Example 5 - bis(triphenylphosphoranylidene) ammonium acetate), rather than the prior art catalysts (such as tetramethylammonium hydroxide, a quaternary ammonium salt (in

Comparative Example 5) and tetrabutylphosphonium hydroxide, a quaternary phosphonium salt (in Comparative Example 6)) in a process of producing a polycarbonate resin, produced even more impressive results when prepared by solid state polymerization (after 10, 15, and 25 hours).

TABLE 2

Classification	<u>Weight-average molecular weight (Mw)</u>			
	Example 5	Comparative Example 4	Comparative Example 5	Comparative Example 6
0 hours	6,769	8,548	9,094	6,740
10 hours	27,831	21,207	24,810	27,017
15 hours	38,894	22,063	29,230	28,162
25 hours	45,867	23,103	31,923	29,000

Accordingly, Applicants respectfully submit that amended claims 1, and 3-22 are patentable over the above-mentioned references, i.e., the US '632 Patent, the EP '657 Patent, or the JP '896 Patent.

#### Claim Rejection under 35 U.S.C. § 103

The Examiner rejected all pending claims under 35 U.S.C. § 103(a) as allegedly being anticipated by U.S. Patent No. 5,401,814 ("the US '814 Patent"). The Examiner contended that the claimed invention is obvious to one of ordinary skill in the art in view of the process disclosed in the US '814 Patent, which is a process of making poly(hydroxyl ethers) by reacting dihydric phenol with a diepoxide in the presence of a catalyst, which is a phosphoranylidene ammonium salt. Applicants respectfully traverse.

There is absolutely no teaching in the US '814 Patent at all regarding a process of making a polycarbonate, as the Examiner has admitted. Moreover, the US '814 Patent teaches using a different starting material, a dihydric phenol with a

diepoxide, to produce a epoxy/carbonate/ester composition, which is a poly(hydroxyl ethers).

The Supreme Court of the United States in *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1732 (2007), recognized that "[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp." (emphasis added). In such circumstances, "the fact that a combination was obvious to try might show that it was obvious under § 103." *Id.* However, that is not the case here.

There is no "finite number of identified, predictable solutions" suggested in the US '814 Patent, and there is no teaching or solution with respect to a process of making a **polycarbonate** resin with a starting material including a **dihydroxy compound** and a **carbonic acid diester** in the presence of a catalyst including a **phosphoranylidene ammonium salt**. Moreover, the Examiner's unsupported statement that it would have been obvious to one of ordinary skill in the art is not enough to meet the burden of *prima facie* obviousness. Accordingly, the present case cannot be rendered obvious in view of the *KSR* decision.

Furthermore, as mentioned above, the claimed present inventions have unexpected results as demonstrated by the experimental data included in the present application. Therefore, Applicants respectfully submit that the amended claims 1, and 3-22 are patentable over the US '814 Patent.

#### Power Of Attorney

Applicants also would like to note that there has been a change of Power of Attorney. A revocation and new Power of Attorney executed by the assignee of this application, along with Statement under 37 C.F.R. 3.73(b), was electronically filed



on June 26, 2007, revoking the power of attorney to Cantor Colburn, LLP, and appointing the new power of attorney to Lerner, David, Littenberg, Krumholz and Mentlik, LLP. A copy of such documents and acknowledgment of receipt of same are attached herewith for your reference. Accordingly, Applicants respectfully request that the Patent Office accept the new Power of Attorney as soon as possible, so that the newly appointed attorneys become the attorneys of record and the correspondence in this application will be mailed to the newly appointed attorneys.


As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that she telephone Applicants' attorney at (908) 654-5000 in order to overcome any additional objections which he might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

Dated: August 3, 2007

Respectfully submitted,

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